

WHAT IS CLAIMED IS:

1. A DNA construct comprising:
as components, a transcriptional initiation
region from a gene capable of expression in a
5 chloroplast joined to a heterologous DNA sequence
encoding a polypeptide of interest, wherein
transcription of said DNA sequence is regulated by said
initiation region, and a transcriptional termination
region.
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2. The DNA construct according to Claim 1, wherein
said gene is a chloroplast gene.
3. The DNA construct according to Claim 1, wherein
15 said gene is a psbA gene, rbcL gene or atpB gene.
4. A chloroplast expression vector comprising:
a transcriptional initiation region from a
gene capable of expression in a chloroplast, a DNA
20 sequence comprising at least one cloning site and a
transcriptional termination region.
5. The expression vector according to Claim 4,
wherein said gene is a chloroplast gene.
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6. The expression vector according to Claim 4,
wherein said gene is a psbA gene, rbcL gene or atpB
gene.
- 30 7. The expression vector according to Claim 4,
wherein said cloning site is a multiple cloning site.
8. The expression vector according to Claim 4,
wherein said transcriptional termination region
35 comprises at least one of a ribosomal RNA T1 or a
ribosomal RNA T2 terminator.

9. The expression vector according to Claim 4,
further comprising:

5 a heterologous DNA sequence encoding a polypeptide
of interest inserted into said cloning site in reading
frame with said transcriptional initiation region.

10. A replication vector comprising:

10 a DNA fragment comprising a replication origin
capable of providing for autonomous replication in a
chloroplast, a transcriptional initiation region from a
gene capable of expression in a chloroplast, a DNA
sequence comprising at least one cloning site and a
transcriptional termination region.

15 11. A chloroplast comprising:

a DNA construct comprising, as components, a
transcriptional initiation region from a gene capable of
expression in a chloroplast joined to a heterologous DNA
sequence encoding a polypeptide of interest, wherein
20 transcription of said DNA sequence is regulated by said
initiation region, and a transcriptional termination
region, wherein said components are operably linked in
vitro.

25 12. A chloroplast comprising:

a chloroplast expression vector comprising, as
components, a DNA fragment comprising a replication
origin capable of providing for autonomous replication
in a chloroplast, a transcriptional initiation region
30 from a gene capable of expression in a chloroplast, a
DNA sequence encoding a polypeptide of interest and a
transcriptional termination region, wherein said
components are operably linked in vitro.

35 13. A plant cell comprising:

a chloroplast according to Claim 11 or Claim 12.

14. The plant cell according to Claim 13, wherein said cell is monocotyledenous or dicotyledenous.

15. A dicotyledenous plant comprising:
5 cells containing chloroplasts according to Claim 11 or Claim 12.

16. A method for introducing heterologous DNA into a chloroplast, said method comprising:
10 transforming a chloroplast in a plant cell with an expression vector comprising, as components, a transcriptional initiation region from a gene capable of expression in a chloroplast, a heterologous DNA sequence encoding a polypeptide of interest and a transcriptional
15 termination region, wherein said components are operably linked in vitro.

17. The method according to Claim 16, wherein said expression vector further comprises:
20 a DNA fragment comprising a chloroplast replication origin.

18. A method for specifically modifying the phenotype of a chloroplast distinct from other
25 organelles, said method comprising:
introducing into a chloroplast in a plant cell, a chloroplast expression vector comprising, as components, a DNA fragment comprising a chloroplast replication origin, a transcriptional initiation region from a
30 chloroplast gene, a DNA sequence encoding a polypeptide of interest and a transcriptional termination region, wherein said components are operably linked in vitro and are functional in said chloroplast; and
growing said cell whereby the phenotype is modified
35 as a result of expression of said DNA sequence.

19. The method according to Claim 16, wherein said introducing comprises:

bombarding said plant cell with a DNA construct comprising said expression vector adsorbed to a bombardment particle.

- 5 20. A chloroplast containing heterologous DNA, prepared according to the method of Claim 19.